EFFECTIVENESS OF POSITIONAL RELEASE TECHNIQUE VERSUS ISCHEMIC COMPRESSION ON SEDENTARY WAY OF LIFE WITH UPPER TRAPEZIUS TRIGGER POINTS

Dissertation submitted to

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In partial fulfillment of the requirements for the degree of

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COLLEGE OF PHYSIOTHERAPY

SRI RAMAKRISHNA INSTITUTE OF PARAMEDICAL SCIENCES

COIMBATORE – 641044

CERTIFICATE

This is to certify that the dissertation work entitled "**Effectiveness of Positional Release Technique versus Ischemic Compression on Sedentary Way of life with Upper Trapezius Trigger Points"** was carried out by the candidate bearing the **Register No. 271710001 (MAY 2019)** in College of Physiotherapy, SRIPMS, Coimbatore, affiliated to the Tamil Nadu Dr. M.G.R Medical University, Chennai towards partial fulfillment of the **Master of Physiotherapy (Advanced Physiotherapy in Orthopaedics).**

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INTERNAL EXAMINER **EXTERNAL EXAMINER**

Place:

Date:

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ABBREVIATIONS

PRT	-	Positional Release Technique
IC	-	Ischemic compression
VAS	-	Visual Analogue Scale
NBQ	-	Neck Bournemouth questionnaire
ROM	-	Range of Motion
CROM	-	Cervical Range of Motion
MTrP	-	Myofascial trigger point
US	-	Ultrasound
MWD	-	Microwave Diathermy
TENS	-	Transcutaneous electrical nerve stimulation
POC	-	Position of comfort
ATP	-	Adenosine triphosphate
Ach	-	Acetylcholine
CGRP	-	Calcitonin gene related peptide

ABSTRACT

Trigger point in upper trapezius is a common cause for neck pain, reduced cervical range of motion, and affects functional activities. Objective is to compare the effectiveness of Positional release technique and Ischemic Compression on reducing pain, improving ROM, functional activities and cognitive aspects of subjects with upper trapezius trigger points. 30 subjects with upper trapezius trigger points were randomized into two groups. Group A received Positional release technique and group B received Ischemic compression technique. The total number of treatment was for 6 days alternatively within two weeks. Outcome measure was measured by Visual Analogue Scale (VAS), cervical range of motion (CROM) and Neck Bournemouth Questionnaire. The mean values for VAS in group A and group B were2.47 and 4.20 respectively, mean values of cervical lateral flexion to the right was 36.93 and 31.86 and for cervical lateral flexion to the left were 38.67 and 33.33 respectively. For cervical extension mean was 64.07 and 60.13, for rotation to the right it was 84.33 and 81.33 and for rotation to the left mean values were 82.27 and 78.80 respectively, NBQ was 20.47 and 22.67 respectively. Positional release technique was superior to Ischemic compression technique in managing pain, ROM, functional disability and psychometric analysis in subjects with upper trapezius trigger points.

Key words: Neck pain, Upper trapezius trigger points, PRT, IC, VAS, CROM, NBQ.

1. INTRODUCTION

Neck pain as a clinical syndrome is common and can be seen in both presence and the absence of history of trauma and or positive radiographic findings. The cervical spine is the most intricate region of the spine, and so are the muscles of this region. Muscles of the neck and shoulder region always function as a unit, and there is no movement in the upper extremity that would not be reflected in the neck musculature. Working posture with the neck flexion increases the load moment three to four times on the neck causing spasm of the neck muscles. Also working tasks that involve continuous arm movements always generate a static load component on these muscles; the principal muscle to carry this load is the trapezius. Neck pain constitutes a significant health care problem affecting 45% to 54% of the general population.

A Myofascial trigger point (MTrP) is a hyperirritable spots, located within a taut band of skeletal muscle that is painful on compression or on stretch and that can give rise to typical motor, sensory and autonomic components. Motor aspects included disturbed motor function, muscle weakness, muscle stiffness and restricted range of motion. Sensory aspects include local tenderness, referral of pain and peripheral and central sensitization.

Etiological factors are poorly understood and are usually multifactorial, including poor posture, anxiety and depression, neck strain, Occupational injuries. Sedentary lifestyle is also cause for neck pain, a person living a sedentary lifestyle is often sitting or lying down while engaged in an activity like reading, socializing, watching television, playing video games, or using a mobile phone/computer for much of the day. There is substantial evidence that such ergonomic risk factors as repetition, awkward posture, contact stress and force if overcome workers biomechanical capabilities may lead to work-related mechanical neck pain. The symptoms usually have postural or mechanical basis which are found to be predictably caused by limited range of motion (ROM), stiffness, shortening or lengthening of muscles, tenderness, cervical pain aggravated by neck movements.

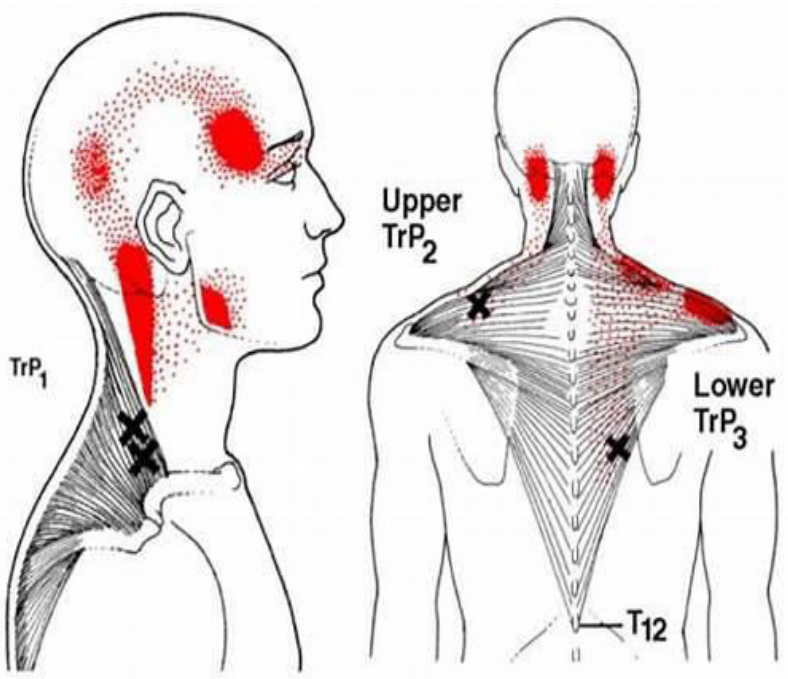
Trigger point form in the muscle's close to the motor end plate (neuromuscular junction). Excess acetylcholine (Ach) is released at the synapse, usually associated with overuse or strain, leading to release of calcium. Resulting ischemia creates an o_2 deficit and energy crisis without available ATP, calcium ions, which are keeping the gate open for ach to keep flowing, cannot be removed. A chemically sustained contracture (without motor potentials) is different from a spasm (involuntary with motor potential). Actin and myosin filaments shorten in the area of the motor end plate. A contracture "knot" forms the characteristic trigger point nodule. The remainder of the sarcomeres of that fiber is stretched, creating the palpable taut band.

The initial change in muscle that is associated with Myofascial pain seems to be the development of the taut band, which is in term a motor abnormality. Several mechanisms have been hypothesized on explain this motor abnormality, the most accepted one is the " Integrated Hypothesis" first developed by Simmons Later expanded by Gravin and Simmons integrated hypothesis is a six link chain that starts with the abnormal release of acetylcholine. This triggers an increase in muscle fiber tension (formation of taut band). The taut band is thought to constrict blood flow that leads to local hypoxia. The reduced oxygen disrupts mitochondrial energy metabolism reducing ATP and leads to tissue distress and the release of sensitizing substances. These sensitizing substances lead to pain by activation of nociceptors and also lead to autonomic modulation that then potentiates the first step: abnormal acetylcholine release.

Grewin expanded this hypothesis by adding more specific details. He stated that sympathetic nervous system activity augments acetylcholine release and that local hypo perfusion caused by the muscle contraction (taut band) resulted in muscle ischemia or hypoxia leading to an acidification of the P^H. The prolonged ischemia also leads to muscle injury resulting in the release of potassium, bradykinins, cytokines, ATP, and substance P which might stimulate nociceptors in the muscle. The end result is the tenderness and pain observed in Myofascial trigger point. Depolarization of nociceptive neurons causes the release of calcitonin gene related peptide CGRP inhibits acetylcholine receptors and release of acetylcholine resulting in SEA. In recent studies Shah et al. Confirmed

the presence of these substance using microdyalisis techniques at trigger point site. Evaluation of substance P, protons (H+), (GRP, bradykinin, serotonin, nor epinephrine, TNF, interleukin, and cytokines were found in active trigger point compared to normal muscle or even latent trigger point. The PH of the active trigger point region was decreased as low as P^H (normal P^H value is 7, 4) causing muscle pain and tenderness as well as a decrease in acetylcholine esterase activity in sustained muscle contraction.

Trapezius being one has to act continuously to hold the head in upright position thus prone for formation of latent trigger point, which with use of inefficient posture like chin forward posture, emotional stress can get activated to become active trp. Location of trigger point in upper trapezius is mid way between c_7 spinous process and acromion.



Various physiotherapy protocols have been advocated in the past like rest, heat, ultrasound therapy (UST), microwave diathermy (MWD), transcutaneous electrical nerve stimulation (TENS), spray and stretch and post-isometric relaxation in treatment of trapezius spasm.

Positional release therapy (PRT) is a method of total body evaluation and treatment using tender points (TPs) and a position of comfort (POC) to resolve the associated dysfunction. PRT is an indirect (the body part moves away from the resistance barrier, i.e, the direction of greatest ease) and passive (the physiotherapist performs all the movement without help from the patient) method of treatment. All three planes of movement are used to attain the position of greatest comfort.

Ischemic compression a manual therapy technique works on same principle of applying sustained pressure to the trigger point and easing the muscle tension. The compression is gradually applied with the finger, thumb, elbow relatively to how much the patient can tolerate and maintained for as long as 90 seconds.

Positional release therapy (PRT) is a method of total body evaluation and treatment using tender points (TPs) and a position of comfort (POC) to resolve the associated dysfunction. PRT is an indirect (the body part moves away from the resistance barrier, i.e., the direction of greatest ease) and passive (the physiotherapist performs all the movement without help from the patient) method of treatment. All three planes of movement are used to attain the position of greatest comfort.

Upper Trapezius and Trigger Points

According to Travell and Simons (1999) referred pain arises as often from trigger points in upper trapezius as in any other muscles of the body.

According to Lundervold (1951) there is an increased EMG activity on upper trapezius muscle in keyboard operators due to tensed upright posture, sitting without a firm back support and typing with keyboard elevated, thus there is more chance of getting recurrent upper trapezius trigger point.

1.1 NEED FOR THE STUDY

The most common cause for neck pain is Myofascial triggers with symptoms of pain, muscle stiffness, restricted ROM, tenderness, etc. Upper trapezius is most affected muscle in neck pain. According to the recent researches the treatment available are rest, heat application, Ultrasound therapy, Microwave diathermy, Transcutaneous electrical nerve stimulation, spray and stretch and post isometric relaxation etc, but these provide only a temporary effect. The main aim of the study is to treat the cause with permanent effect of decreasing pain, increasing range of motion, functional disability and psychometric analysis. This can be achieved by integrating and comparing the recent techniques like Positional releasing technique and Ischemic compression technique.

1.2 OBJECTIVE OF THE STUDY

- To evaluate the effectiveness of Positional Releasing technique on pain, ROM, functional disability and psychometric analysis.
- To evaluate the effectiveness of Ischemic Compression on pain, ROM, functional disability and psychometric analysis.
- To compare the effectiveness of Ischemic compression and Positional releasing technique on pain, ROM, functional disability and psychometric analysis.

1.3 HYPOTHESIS

Null Hypothesis

There is no significant difference between the **"Positional Releasing Technique and Ischemic Compression"** on pain, ROM, functional disability and psychometric analysis in patients with upper trapezius trigger points.

Alternative Hypothesis

Alternative hypothesis states that there is a significant difference between **"Positional Release Technique and Ischemic Compression"** on pain, ROM, functional disability and psychometric analysis in patients with upper trapezius trigger points.

2. REVIEW OF LITERATURE

- **Shweta Anil Kulkarni et.al (2017)** conducted a study to compare effectiveness of Ischemic compression v/s Myofascial release on myofascial trigger point of upper trapezius. They selected 30 patients measure the pain intensity by VAS and Neck disability index. They concluded that Ischemic compression shows greater effectiveness as compared with myofascial release in treatment of trigger point pain of upper trapezius.

- **Priyanka Devang Rana et.al (2017)** conducted a study to compare the Effect of MET versus PRT in computer workers with upper trapezius muscle spasm. They selected 60 patients those were measured VAS, NDIS, cervical ROM were measured using universal goniometer and manual muscle testing done. They concluded that PRT was more statistically and clinically effective for decreasing VAS, NDI score and improving ROM and MMT. PRT showed earlier pain relief as compared to MET.

- **Ameneh Amini et.al (2017)** conducted a study to compare the effects of Manual passive muscle shortening and positional release therapy on latent myofascial trigger point of the upper trapezius. They selected 30 female students were measured VAS, pressure pain threshold and bilateral active range of cervical lateral flexion were recorded. They concluded that both MPMS and PRT were effective techniques in immediate pain relief of upper trapezius MTrPS.

- **Danilo Harudy Kamonseki et.al (2016)** evaluates the Translation and Validation of Neck Bournemouth Questionnaire to Brazilian Portuguese. They selected 61 volunteers presenting neck pain participated in this study. They concluded that Neck Bournemouth Questionnaire was translated and culturally adapted to Portuguese language, and it demonstrated to be valid and reliable to evaluate patient's neck pain.

- **Gurkan Gunaydin et.al (2016)** evaluates the Reliability, Validity and cross Cultural Adaptation of the Turkish version of the Bournemouth Questionnaire. They selected 110 patients for low back pain. They concluded that the BO is a valid and reliable tool for the Turkish population.

- **Tommaso Giri et.al (2015)** In this study determined that the psychometric properties of the NBQ in patients with chronic neck pain. They proved that NBQ may provide useful clinical profiles and change score of subjects with chronic neck pain.

- **Ahmed Samir Mohamed Abdelhamid et.al (2015)** conducted a study to compare the Ischemic compression versus Traditional physical therapy in treatment of chronic mechanical neck pain. They selected 40 patients were pain evaluated by VAS, neck pain and disability scale (NPADS) and cervical range of motion (CROM) were evaluated. They concluded that ICT is effective and is better than TPTT in improving pain sensation, disability and CROMS in patients with CMNP.

- **G. Yatheendra Kumar et.al (2015)** conducted a study to compare the effectiveness of MET, IC and strain counter strain on upper trapezius trigger point. They selected 45 patients were measured VAS for pain, cervical lateral flexion range of motion and NDI. They concluded that MET is effective in the treatment of upper trapezius trigger points.

- **Sweety Charles Carralho et.al (2014)** conducted a study to compare effect of PRT in subjects with subacute trapezitis. They selected 40 subjects were measured VAS, NDI and cervical range of motion. They concluded that PRT with trapezius stretching found to be significantly more added effect than trapezius stretching alone in improving pain, functional disability and cervical movement for subjects with subacute trapezitis.

- **Tommaso Geri, Alessio Signori et.al (2014)** conducted a study to compare cross-cultural adaptation and validation of the Neck Bournemouth Questionnaire in the Italian population. A total 108 subject were selected 80 were women and 28 were men. They suggested NBQ as a two factor structure whose construct validity and responsiveness are moderate. The result change and important of the Psycho, Social ability of the patient clinically important is deducted by the NBQ.

- **Cagnie B, Dewitte V et.al (2013)** conducted a study to compare the effect of Ischemic compression on trigger point in the neck and shoulder muscles in office workers: They measured Numeric rating scale, NDI, Neck mobility(inclinometer) muscle strength(dynamometer). They concluded that treatment of TpS for IC resulted in a significant improvement in general neck and shoulder complaints, pressure pain sensitivity, mobility and muscle strength in the short term in a small sample of office workers with mildly severe chronic pain.

- **Boonstra, Anne M et.al (2008)** conducted a study to compare VAS for disability in patients with chronic musculoskeletal pain. They selected 52 patients in the reliability study, 324 patients in the validity study. They concluded the study was that the reliability of the VAS for disability is moderate to good. Because of a weak correlation with other disability instruments and a strong correlation with the VAS poor pain, however, its validity is questionable.

- **Gopal S Nambi et.al (2013)** conducted a study to compare difference in effect between IC and MET on upper trapezius myofascial trigger points. They selected 30 patients measured pain intensity by VAS and range of motion by universal goniometer. They concluded that MET with ultrasound may be more effective in reducing pain and improve ROM in patients in upper trapezius MtrPs.

- **Jagatheesan Alagesan et.al (2012)** conducted a study to compare the effect of PRT and Taping on unilateral upper trapezius tender points. They selected 60 patients were measured pain by numeric pain rating scale and active range of ipsilateral neck flexion measured by goniometer. They concluded that conventional treatment with PRT and conventional treatment with taping are equally effective in unilateral upper trapezius tender points.

- **Aguilera F. J.M Martin et.al (2009)** conducted a study to compare the effect of ultra sound and IC techniques for the treatment of upper trapezius latent myofascial trigger point in healthy subjects. They selected 66 patients were measured active ROM of cervical rachis using cervical range of motion instrument, basal electrical activity of muscle trapezius measured with surface electromyography. They concluded that both treatments have been shown to be effective in the treatment of latent myofascial trigger points.

- **Gay RE, Madson. TJ, et.al (2007).** This prospective longitudinal study was compared the NDI and the NBQ. They are proved that both are sensitive to change and would be efficient outcome tools in studies of chronic neck pain**.**

- **Hugh Gemmell et.al (2007)** conducted a study to compare the effect of IC and trigger point pressure release on neck pain and upper trapezius trigger points. They selected 60 patients were measured pain level and degree of lateral flexion were assessed. They concluded that patient treated with IC is the five time more likely to improve compared to a patient treated with SUS.

- **Olaogun M, Adedoyin et.al (2003)** conducted a study to compare the Reliability and concurrent validity of Visual Analogue Scale and Modified Verbal Rating Scale of pain Assessment in Nigeria. They were selected 27 patients with diagnosed OA. This study concluded that the use of VAS and MVRS together with the flexed knee procedure is there for suggest significantly high validity scale.

- **Bolton J E. Humphereys B.K. et.al (2002)** conducted a study the Bournemouth questionnaire, a short form comprehensive outcome measure. Psychometric properties in neck pain patients. They selected 102 patients in, they concluded that NBQ the salient dimensions of the biopsychosocial model of pain, is quick and easy to complete, and has been shown to be reliable, valid and responsible to clinically significant change in patients with nonspecific neck pain. Its use as an outcome measure in clinical trial and outcomes research is recommended.

- **Polly E, Bijur et.al (2001)** conducted a study to compare the Reliability of the visual analogue scale for measurement of acute pain. This was a prospective convenience sample of adult with acute pain presenting. These study findings indicate that the VAS is a highly reliable instrument for measurement of acute pain.

3. MATERIAL AND METHODOLOGY

The purpose of this study was to record the effectiveness of the Positional Releasing technique and Ischemic Compression in patients with treatment of upper trapezius trigger points.

3.1 MATERIALS

- VAS scale
- Universal Goniometer
- Assessment chart
- Neck Bournemouth Questionnaire
- Couch and plinth
- Chair

3.2 METHODOLOGY

3.2.1 Study Setting

This study was carried out in the department of physiotherapy under supervision of the staff in charge, at Sri Ramakrishna Hospital, SRIPMS Coimbatore.

3.2.2 Study Design

It was a comparative study design

3.2.3 Sample Size

A total number of 50 patients were selected for the study. 20 of them were excluded for various reasons. Out of 30 who full fill the inclusion criteria were assigned in to two groups.

3.2.4 Sample Format

The study sampling was convenient sampling and were assigned in to two groups, group A and group B.

3.2.5 Study Duration

The study duration was 6 months.

3.2.6 Treatment Duration

The treatment duration was 2 weeks. The patients was treated for 25 minutes once every alternative day, for 2 weeks.

3.2.7 Selection Criteria

Inclusion Criteria

- Age limit 20-30 years
- Both male and female
- VAS value of minimum 4
- Volunteers having mechanical neck pain with upper trapezius trigger points
- Duration of the pain 1 month
- Being non athletic

Exclusion Criteria

- History of trauma or fractures in cervical spine
- Cervical spine surgery
- Skin disease
- Peoples who are taking pain killers
- Neck and back deformity likes scoliosis, torticollis
- Signs of cervical radiculopathy or myopathy
- Hyper mobile joints
- Sensory disturbance in the trapezius area

3.2.8 Outcome Measures

- The visual analogue scale is a tool to measure the intensity of pain.
- The universal goniometer to evaluate the range of motion.
- Neck Bournemouth questionnaire for measuring the functional disability and psychometric analysis of the patient.

3.2.9 Interventions

Group A

- Moist heat
- Positional release technique
- Home exercise

Group B

- Moist heat
- Ischemic compression
- Home exercise

3.2.10 Parameters

The following parameters were assessed for analysis of the outcomes.

- Pain
- ROM
- Functional disability and psychometric analysis

3.2.11 Tools for Data Collection

The following tools were used for analysis of the outcomes.

- Visual analogue scale
- Universal Goniometer
- Neck Bournemouth Questionnaire

3.2.12 Statistical Tool Used

The study was conducted with the two groups, group A and group B.

Unpaired 't'test

The unpaired't' test was used to compare the post-test values between the two groups

Formula

$$S = \sqrt{\frac{\sum(x_1 - \overline{x_1})^2 + \sum(x_2 - \overline{x_2})^2}{(n_1 + n_2 - 2)}}$$

$$t = \frac{\overline{x_1} - \overline{x_2}}{s} \sqrt{\frac{n_1 n_2}{n_1 + n_2}}$$

Sd = standard deviation

$\overline{x_1}$ = mean values of group A

$\overline{x_2}$ = mean values of group B

n_1 = number of subjects in group A

n_2 = number of subjects in group B

t = calculate table value

4. DATA ANALYSIS AND INTERPRETATION

The pre test and post test values were taken and the reduction in pain, improvement in Range of motion, functional disability and psychometric analysis was evaluated.

- Visual Analogue Scale
- Universal Goniometer
- Neck Bournemouth questionnaire

Table 4.1

VISUAL ANALOGUE SCALE FOR GROUP A

S. NO	Pre test	Post test (X^1)	X_1-X^1	$(X_1-X^1)^2$
1	8	4	1.53	2.34
2	8	2	0.47	0.22
3	10	4	1.53	2.34
4	10	3	0.53	0.28
5	8	0	2.47	6.10
6	9	4	1.53	2.34
7	7	1	1.47	2.16
8	8	2	0.47	0.22
9	9	3	0.53	0.28
10	7	0	2.47	6.10
11	10	4	1.53	2.34
12	7	1	1.47	2.16
13	9	4	1.53	2.34
14	8	2	0.47	0.22
15	10	3	0.53	0.28

Table 4.2

VISUAL ANALOGUE SCALE FOR GROUP B

S.NO	Pre test	Post test X^2	X_2-X^1	$(X_2-X^1)^2$
1	10	6	1.80	3.24
2	8	3	1.20	1.44
3	7	2	2.20	4.84
4	8	4	0.20	0.04
5	9	5	0.80	0.64
6	10	5	0.80	0.64
7	10	6	1.80	3.24
8	8	4	0.20	0.04
9	8	2	2.20	4.84
10	9	5	0.80	0.64
11	9	4	0.20	0.04
12	8	3	1.20	1.44
13	10	6	1.80	3.24
14	8	3	1.20	1.44
15	9	5	0.80	0.64

Table 4.3

MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B (VAS)

GROUP	MEAN	SD	't' VALUE	'p' VALUE
GROUP A	2.46	1.41	3.3526	0.0023
GROUP B	4.20			

Graph 1

MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B (VAS)

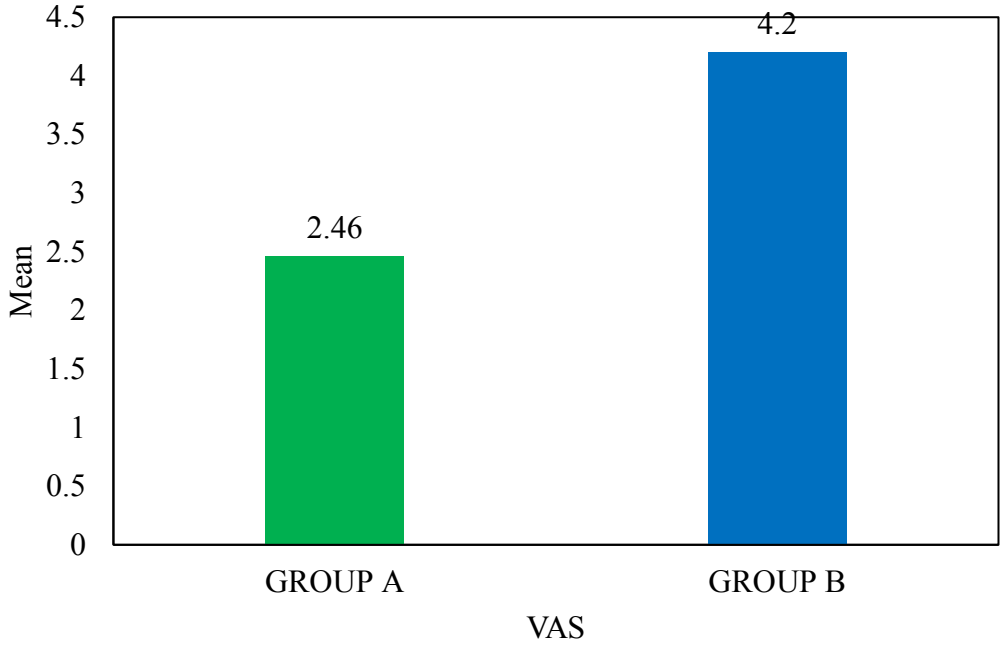


Table 4.4

EXTENSION CERVICAL ROM (DEGREES) FOR GROUP A

S.No	Pre test	Post test X^2	X_2-X^1	$(X_2-X^1)^2$
1	48	64	-0.06	0.003
2	55	68	3.94	15.52
3	50	67	2.94	8.64
4	50	62	-2.06	4.24
5	43	68	3.94	15.52
6	40	62	-2.06	4.24
7	45	65	0.94	0.88
8	37	62	-2.06	4.24
9	35	64	-0.06	0.003
10	46	60	-4.06	16.48
11	38	60	-4.06	16.48
12	47	65	0.94	0.88
13	38	63	-1.06	1.12
14	45	64	-0.06	0.003
15	36	67	2.94	8.64

Table 4.5

EXTENSION CERVICAL ROM (DEGREES) GROUP B

S.No	Pre test	Post test X^2	X_2-X^1	$(X_2-X^1)^2$
1	35	58	-2.13	4.53
2	30	60	-0.13	0.01
3	50	60	-0.13	0.01
4	35	62	1.87	3.49
5	50	58	-2.13	4.53
6	50	60	-0.13	0.01
7	48	63	2.87	8.23
8	45	58	-2.13	4.53
9	30	58	-2.13	4.53
10	30	60	-0.13	0.01
11	35	61	0.87	0.75
12	34	60	-0.13	0.01
13	40	62	1.87	3.49
14	30	60	-0.13	0.01
15	30	62	1.87	3.49

TABLE 4.6

MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B

CERVICAL EXTENSION

GROUP	MEAN	SD	't' VALUE	'p' VALUE
GROUP A	64.07	2.19	4.9118	0.0001
GROUP B	60.13			

Graph 2

MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B

CERVICAL EXTENSION

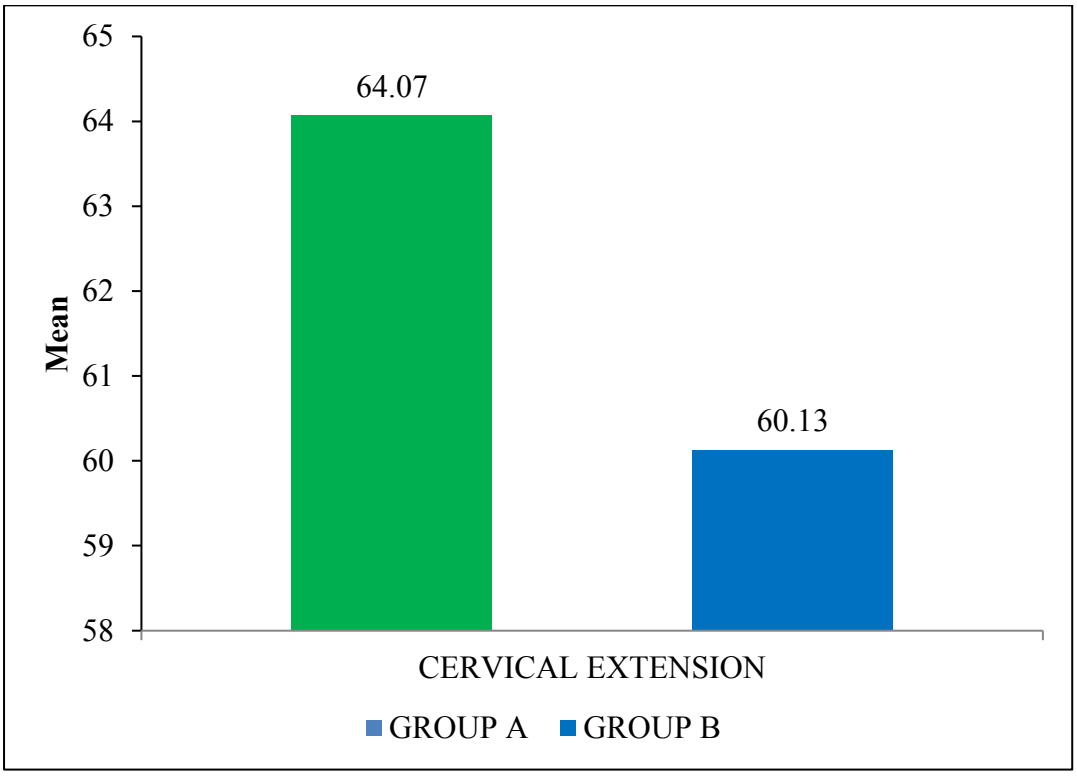


Table 4.7

CERVICAL ROTATION TO THE RIGHT (DEGREES)

GROUP A

S.No	Pre test	Post test X^2	X_2-X^1	$(X_2-X^1)^2$
1	30	85	0.65	0.44
2	50	83	1.33	1.78
3	35	84	0.33	0.11
4	54	82	2.33	5.44
5	50	85	0.67	0.44
6	40	84	0.33	0.11
7	45	85	0.67	0.44
8	35	86	0.33	0.11
9	30	84	0.33	0.11
10	30	83	1.33	1.78
11	35	85	0.67	0.44
12	34	86	0.33	0.11
13	40	84	0.33	0.11
14	30	85	0.67	0.44
15	30	84	0.33	0.11

Table 4.8

CERVICAL ROTATION TO THE RIGHT (DEGREES)

GROUP B

S.No	Pre test	Post test X^2	X_2-X^1	$(X_2-X^1)^2$
1	37	82	1.67	0.44
2	48	83	0.67	2.78
3	45	84	3.67	7.11
4	50	85	3.67	13.44
5	30	80	1.33	1.78
6	43	78	3.33	11.11
7	40	78	3.33	11.11
8	40	80	1.33	1.78
9	36	83	2.67	7.11
10	47	84	1.67	2.78
11	36	79	2.67	7.11
12	38	80	1.33	1.78
13	46	82	0.67	0.44
14	38	82	0.67	0.44
15	44	80	1.33	1.78

Table 4.9

MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B CERVICAL ROTATION TO RIGHT

GROUP	MEAN	SD	't' VALUE	'p' VALUE
GROUP A	84.33	1.78	4.66	0.000068
GROUP B	81.33			

Graph 3

MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B CERVICAL ROTATION TO RIGHT

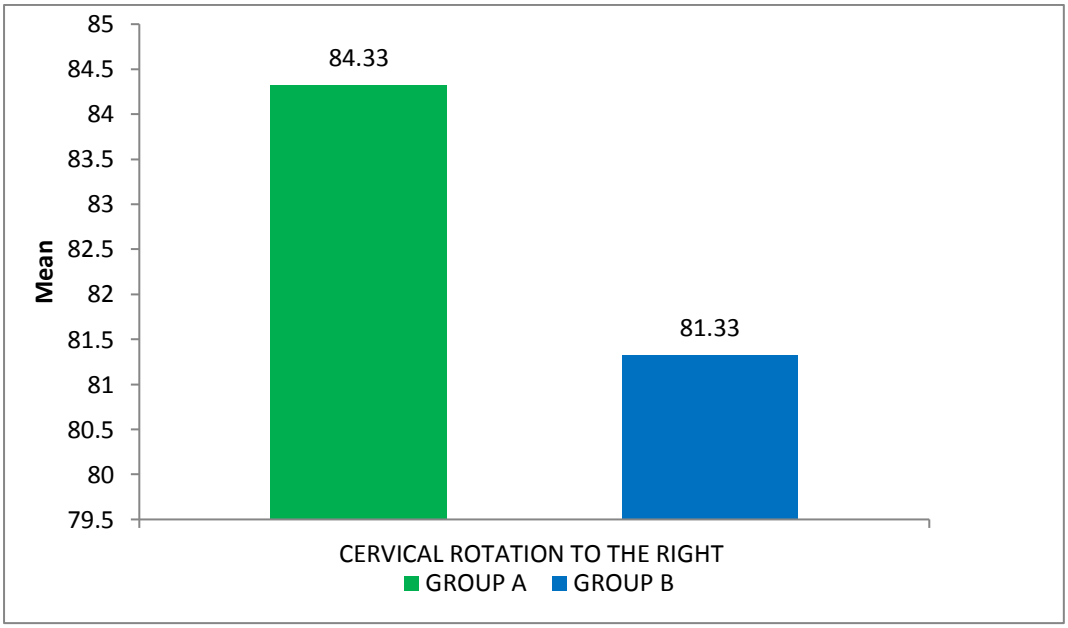


Table 4.10

CERVICAL ROTATION TO THE LEFT (DEGREES)

GROUP A

S.No	Pre test	Post test X^2	X_2-X^1	$(X_2-X^1)^2$
1	45	80	2.27	5.14
2	50	83	0.73	0.54
3	52	80	2.27	5.14
4	50	84	1.73	3
5	48	85	2.73	7.47
6	42	85	2.73	7.47
7	43	84	1.73	3
8	35	86	3.73	13.94
9	36	78	4.27	18.20
10	38	86	3.73	13.94
11	35	78	4.27	18.20
12	40	87	4.73	22,40
13	40	80	2.27	5.14
14	33	77	5.27	27.74
15	35	81	1.73	1.60

Table 4.11

CERVICAL ROTATION TO THE LEFT (DERGREES) GROUP B

S.No	Pre test	Post test X^2	X_2-X^1	$(X_2-X^1)^2$
1	40	82	3.20	10.24
2	48	80	1.20	1.44
3	45	80	1.20	1.44
4	35	79	0.20	0.04
5	33	78	0.80	0.64
6	40	78	0.80	0.64
7	40	75	3.80	14.44
8	38	75	3.80	14.44
9	42	83	4.20	17.64
10	44	82	3.20	10.24
11	37	76	2.80	7.84
12	38	79	0.20	0.04
13	42	83	4.20	17.64
14	36	79	0.20	0.04
15	42	73	5.80	33.64

Table 4.12

MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B

CERVICAL ROTATION TO THE LEFT

	MEAN	SD	't' VALUE	'p' VALUE
GROUP A	82.27	3.15	2.98	0.0058
GROUP B	78.80			

Graph 4

MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B

CERVICAL ROTATION TO THE LEFT

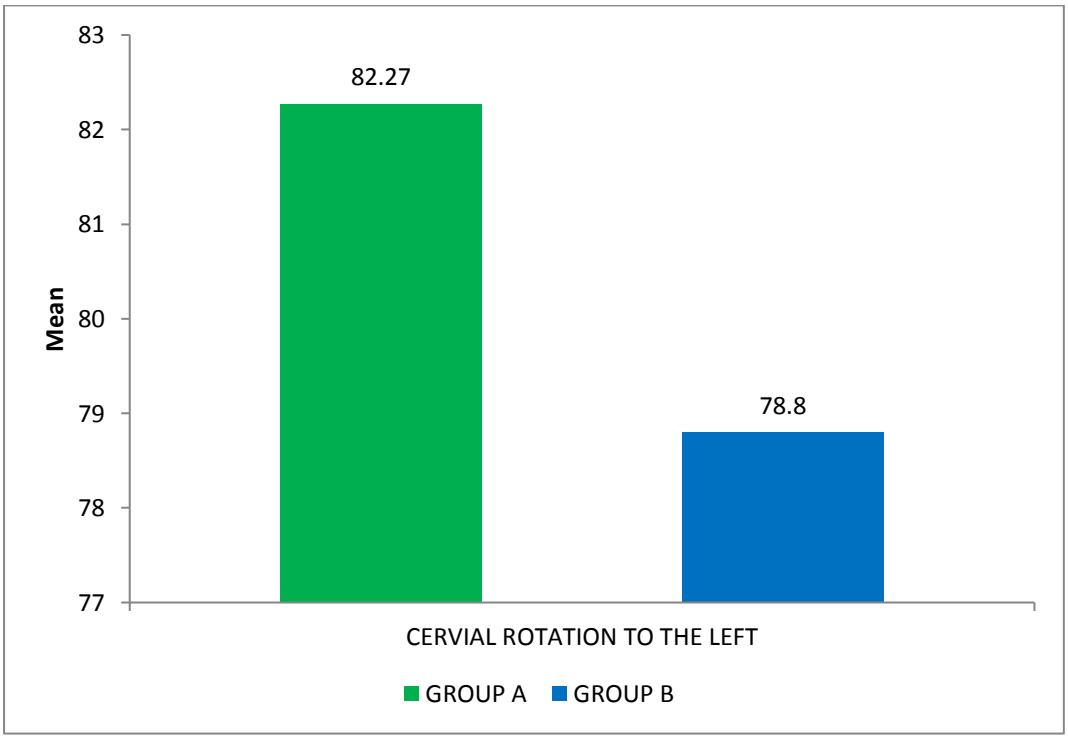


Table 4.13

CERVICAL LATERAL FLEXION TO THE RIGHT (DEGREES)

GROUPA

S.No	Pre test	Post test X^2	X_2-X^1	$(X_2-X^1)^2$
1	35	40	3.07	9.42
2	27	40	3.07	9.42
3	30	38	1.07	1.14
4	21	32	-4.93	24.30
5	22	37	0.07	0.004
6	26	32	-4.93	24.30
7	25	34	-2.93	8.58
8	33	34	-2.93	8.58
9	28	35	-1.93	3.72
10	22	34	-2.93	8.58
11	31	34	-2.93	8.58
12	29	38	1.07	1.14
13	35	40	3.07	9.42
14	39	42	5.07	25.70
15	42	44	7.07	49.98

Table 4.14

CERVICAL LATERAL FLEXION TO THE RIGHT (DEGREES)

GROUP B

S.No	Pre test	Post test X^2	X_2-X^1	$(X_2-X^1)^2$
1	23	32	0.14	0.01
2	19	30	-1.86	3.45
3	22	32	0.14	0.01
4	20	32	0.14	0.01
5	20	30	-1.86	3.45
6	21	32	0.14	0.01
7	20	34	2.14	4.57
8	21	33	1.14	1.29
9	23	33	1.14	1.29
10	22	32	0.14	0.01
11	22	28	-3.86	14.89
12	20	32	0.14	0.01
13	19	32	0.14	0.01
14	16	34	2.14	4.57
15	18	32	0.14	0.01

TABLE 4.15

MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B FOR CERVICAL LATERAL FLEXION TO THE RIGHT

GROUP	MEAN	SD	't' VALUE	''p VALUE
GROUP A	36.93	2.84	4.7881	0.0001
GROUP B	31.86			

Graph 5

MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B FOR CERVICAL LATERAL FLEXION TO THE RIGHT

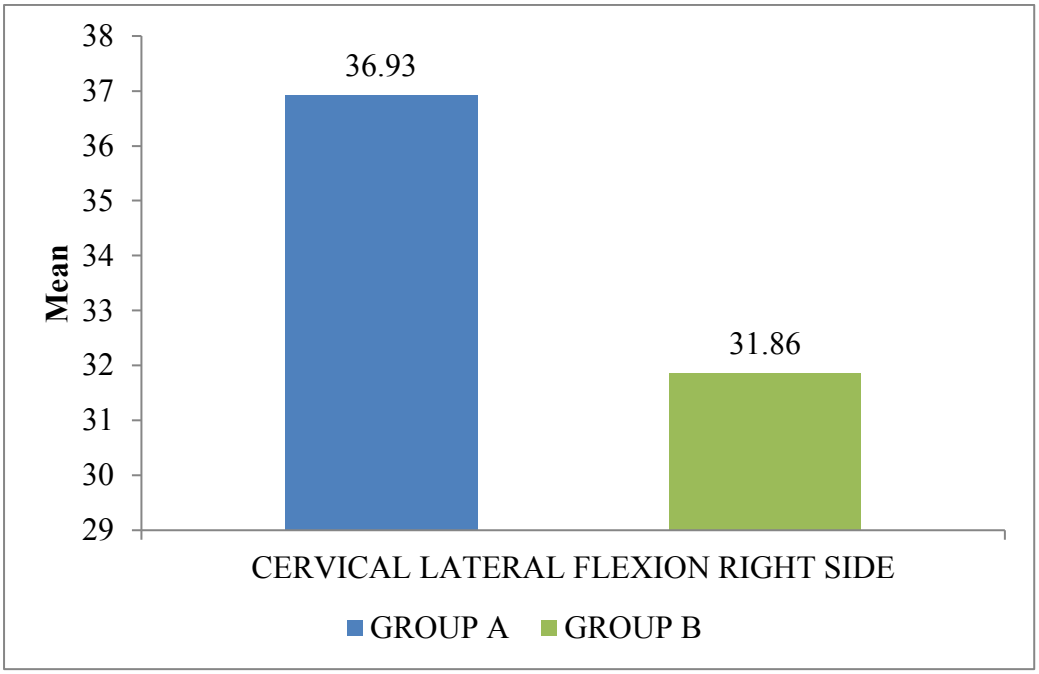


Table 4.16

CERVICAL LATERAL FLEXION TO THE LEFT

(DEGREES) GROUP A

S.No	Pre test	Post test X^2	X_2-X^1	$(X_2$-$X^1)^2$
1	29	42	3.34	11.15
2	30	42	3.34	11.15
3	30	40	1.34	1.79
4	24	38	-0.66	0.43
5	23	38	-0.66	0.43
6	25	38	-0.66	0.43
7	26	34	-4.66	21.43
8	27	38	-0.66	0.43
9	28	40	1.34	1.79
10	22	42	3.34	11.15
11	30	38	-0.66	0.43
12	28	40	1.34	1.79
13	35	38	-0.66	0.43
14	28	38	-0.66	0.43
15	26	34	-4.66	21.43

Table 4.17

CERVICAL LATERAL FLEXION TO THE LEFT (DEGREES)

GROUP B

S.No	Pre test	Post test X^2	X_2-X^1	$(X_2-X^1)^2$
1	23	40	6.67	44.48
2	25	40	6.67	44.48
3	22	34	0.67	0.44
4	20	34	0.67	0.44
5	20	30	-3.33	11.08
6	21	32	-1.33	1.76
7	22	34	0.67	0.44
8	20	30	-3.33	11.08
9	23	40	6.67	44.48
10	20	32	-1.33	1.76
11	22	30	-3.33	11.07
12	23	28	-5.33	28.40
13	19	30	-3.33	11.08
14	18	32	-1.33	1.76
15	17	34	0.67	0.44

Table 4.18

MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B FOR CERVICAL LATERAL FLEXION TO THE LEFT

GROUP	MEAN	SD	't' VALUE	'p' VALUE
GROUP A	38.67	3.26	4.4721	0.0001
GROUP B	33.33			

Graph 6

MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B FOR CERVICAL LATERAL FLEXION TO THE LEFT

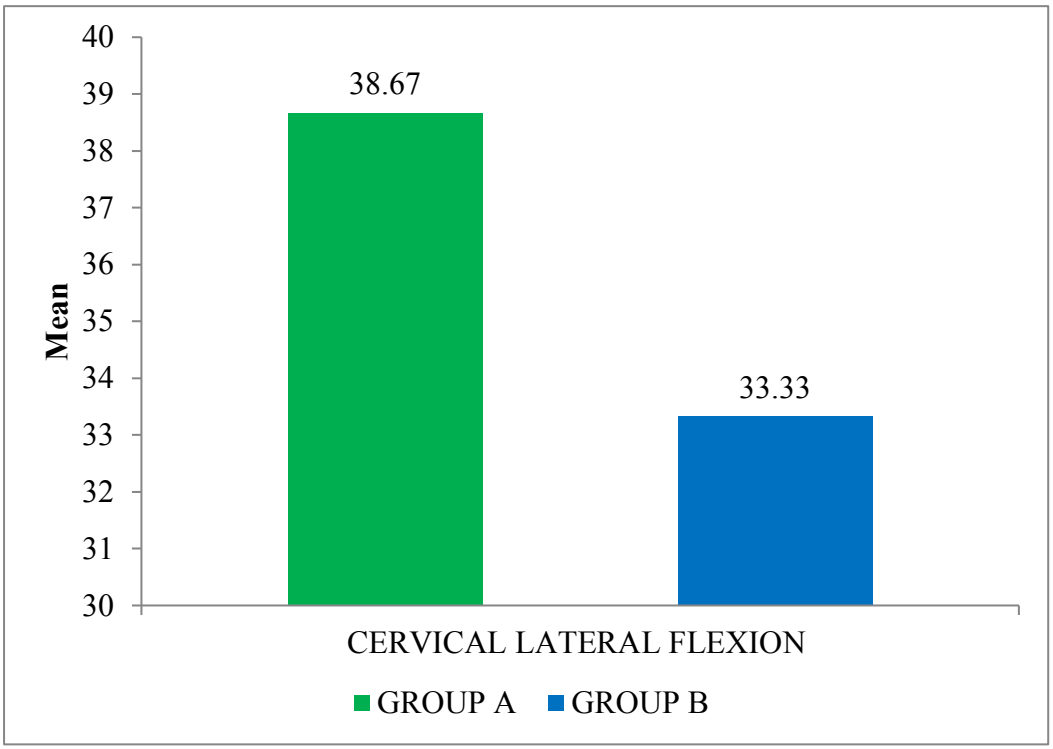


Table 4.19

NECK BOURNEMOUTH QUESTIONNAIRE FOR GROUP A

S. No	Pre test	Post test	X_1-X^1	$(X_1-X^1)^2$
1	54	22	1.54	2.37
2	52	24	3.54	12.53
3	50	22	1.54	2.37
4	55	18	-2.46	6.05
5	48	18	-2.46	6.05
6	46	17	-3.36	11.97
7	50	22	1.54	2.37
8	56	18	-2.46	6.05
9	52	20	-0.46	0.21
10	50	21	0.54	0.29
11	48	24	3.54	12.53
12	52	20	-0.46	0.21
13	48	18	-2.46	6.05
14	54	22	1.54	2.37
15	50	21	0.54	0.29

Table 4.20

NECK BOURNEMOUTH QUESTIONNAIRE FOR GROUP B

S.No	Pre test	Post test X^2	X_2-X^1	$(X_2-X^1)^2$
1	52	28	5.34	28.51
2	54	26	3.34	11.15
3	55	27	4.34	18.83
4	50	24	1.34	1.79
5	46	19	-3.66	13.39
6	48	22	-0.66	0.43
7	52	22	-0.66	0.43
8	50	25	2.34	5.47
9	48	22	-0.66	0.43
10	55	22	-0.66	0.43
11	49	19	-3.66	13.39
12	56	17	-5.66	32.03
13	52	24	1.34	1.79
14	48	22	-0.66	0.43
15	52	21	-1.66	2.75

TABLE 4.21

MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B

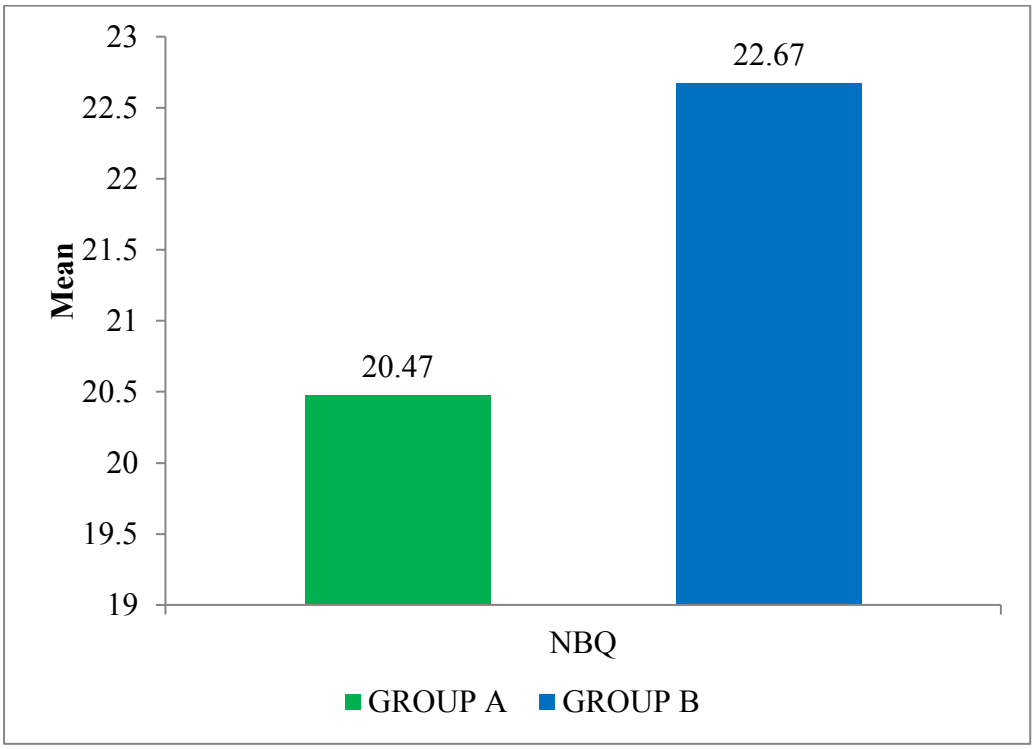
NECK BOURNEMOUTH QUESTIONNAIRE

GROUP	MEAN	SD	't' VALUE	'p' VALUE
GROUP A	20.47	2.69	2.2372	0.033
GROUP B	22.67			

Graph 7

MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B

NECK BOURNEMOUTH QUESTIONNAIRE



5. DISCUSSION

Upper trapezius is the most common postural muscle that tend to get shorten leading to restricted neck mobility as they are most frequently used to maintain posture. Mechanical neck pain a common problem within our society affecting individual's physical and social functioning considerably and interfering with sufferer's daily activities. Probably most of the patient suffering from pain and decreased neck activity is due to upper trapezius trigger points.

In present study pain and neck activity is taken as the parameters and they were scored by using the visual analogue scale, goniometer and neck Bournemouth questionnaire.

There are different treatments approaches that can be used for the upper trapezius trigger points. In this study we used the Positional release technique and Ischemic compression technique as the treatment approaches to full fill the aim of study, to compare the effectiveness of both treatments in patients with neck pain due to upper trapezius muscle trigger points.

Within two group analysis were revealed that there is a significant decrease in Group A patient reported pain, range of motion and neck activity scores when post test and post test were compared.

Mean score of group A for VAS was 2.47 and for group B was 4.20. Mean score of group A and group B had difference in their value. But more reduce in group A. SD and t value were 1.41 and 3.35 respectively. p value was 0.0023.

Extension CROM mean value for group A was 64.07 and for group B 60.13. Here also group A had higher value. 2.19 and 4.91were the SD and the t value. P value was 0.0001.

In cervical rotation to the right, group A mean value was 84.33 and for group B it was 81.33. Higher value are seen in group A. SD was 1.78 and t value was 4.66 with p value of 0.000068. For cervical rotation to the left mean values were 82.27 and 78.80. SD and t values were 3.15 and 2.98 respectively with a p value of 0.0058.

In cervical lateral flexion to the right mean value of group A was 36.93 and for group B it was 31.86. A higher value is seen in group A. SD and t value were 2.84 and 4.78 respectively. P value was 0.0001. In cervical lateral flexion to the left mean value of group A was 38.67 and for group B it was 33.33. A greater value is found in group A. SD and t values were 3.26 and 4.47 respectively and a p value of 0.0001.

For NBQ the mean value of group A was 20.47 and for B mean was 22.67. From this group A had functional and cognitive improvement than group B. SD and t value was 2.69 and 2.23 respectively. P value of 0.033.

On analyzing the statistical values there is a difference between the parameters among group A and group B. The value was higher in group A.

During the time of follow up group B had recurrence of pain, decreased CROM and activity limitation than group A which was only clinically identified.

This study gives an excellent view into the application of Positional Release technique over Ischemic Compression technique for treating sedentary way of life with upper trapezius trigger points.

6. CONCLUSION

Positional Release technique and Ischemic Compression technique was found to be in reducing pain, ROM, functional disability and psychometric analysis in patients with neck pain due to upper trapezius trigger points. However according to statistical analysis Positional release technique was superior to Ischemic compression technique.

Hence rejecting the null hypothesis and accepting the alternative hypothesis. Thus the study concluded that there is a significant difference between Positional Release technique versus Ischemic Compression on pain, range of motion functional disability and psychometric analysis in upper trapezius trigger points.

LIMITATIONS

- sample size taken was small
- Generalizability of the findings is limited by short term follow up used in this study.
- Patients may not follow the advice in a correct manner.
- Treatment was given only 2 weeks duration.
- Not consider the shoulder range of motion

RECOMMENDATIONS

- Study can be done with a larger sample size and longer study duration.
- In future treatment studies can be modified with other techniques and parameters.

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APPENDICES

APPENDIX - I

ASSESSMENT CHART

Subjective Assessment

Demographic data

Name:

Age:

Sex:

Occupation:

IP/OP number:

Address:

Date of evaluation:

Chief complaints:

History

Past medical history:

Present medical history:

Surgical history:

Drug history:

Personal history:

On Observation

Built:

Posture / postural changes (neck):

Swelling:

Fracture of cervical spine and shoulder:

Any congenital abnormality:

Contracture/ deformity:

Any Inflammatory or malignant disease:

External appliances (cervical collar):

Respiratory muscle movements:

- On inspiration:
- On expiration:

On Palpation

Tenderness:

Warmth:

Tropical changes:

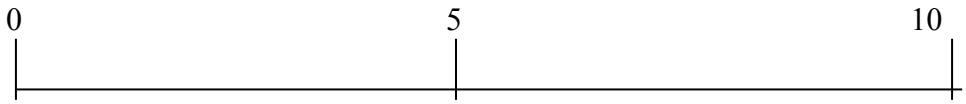
Trigger point:(upper trapezius)

- Criteria includes
  - Palpable taut band
  - Spot tenderness in the taut band
  - Referred pain as the “familiar pain”
  - Pincer flat technique for upper trapezius
  - Look for local twitch response

On Examination

- Vital Sign
- Blood Pressure (mmHg):
- Respiratory rate(/m):
- Pulse rate (/m):
- Heart rate (/m):
- Pain assessment

VAS scale:



Mild Moderate Severe

- Site of pain:
- Duration of pain:
- Quality of pain:
- Relieving factor:
- Severity of pain:
- Time of pain:
- Insufficient ADL activity due to pain:

❖ Range Of Motion

I. Range of motion - Neck

Movement	**Range Of Motion (Degree)**
Neck flexion	
Neck extension	
Lateral flexion	Right-Left
Rotation	Right-left

Range of motion – Shoulder

Movement	**Range Of Motion (Degree)**	
	Right	**Left**
Flexion		
Extension		
Abduction		
Adduction		
Internal rotation		
External rotation		

- ❖ Sensation:
  - Deep
  - Superficial
- ❖ Neurological Examination
  - Vertigo
  - dizziness
  - Neck pain radiating into arms and upper extremity
  - Cervical radiculopathy,
  - Cervical spondylosis
- ❖ Functional activity
- ❖ Using Neck Disability Index Scale
- ❖ Special test:
- ➢ Test for neurological symptoms:

I. Neurodynamic test
   - ULTT 1
   - ULTT2
   - ULTT3
   - ULTT4

II. Distraction and compression test

III. Spurling(Foraminal compression)

IV. Scalene cramp test

V. Shoulder depression test

VI. Romberg test

VII. Lhermitte sign

- Test for cervical instability:

I. Anterior shear or sagittal test

- Differential diagnosis: Facial neuralgia or cervical radiculopathy or other trigger point
- Investigation
- Diagnosis
- Physiotherapy management

- Aims
- Goals
- Intervention plan

  Group A- Positional Release Technique

  Group B – Ischemic Compression

- Home advices
- Follow-Up

APPENDIC II

FOLLOW UP CHART

Patient name:

Age:

Sex:

Occupation:

Address:

In patient outpatient no:

Condition:

Chart:

Parameters	Pretest value	Posttest value	Value after 3 weeks
VAS			
Goniometer			
NBQ			

APPENDIX III

TOOLS FOR MEASUREMENT

VISUAL ANALOGUE SCALE

The VAS score is determined by measuring in millimeters from left hand end of the line to the point that the patient marks.

How severe is your pain today? Place a vertical mark on the line below to indicate how bad you feel your pain is today.

No pain Very severe pain

1 2 3 4 5 6 7 8 9 10

NECK BOURNEMOUTH QUESTIONNAIRE

Neck Bournemouth questionnaire used to evaluate the impact of pain on patient's psyche and on socio- professional relationship for measuring the functional disability and psychometric evaluation.

Instruction: The following scales have been designed to find out about your neck pain and how it is affecting you. Please answer all the scales, and mark the one numbers on each scale that best described how you feel.

1. Over the past week, on average, how would you rate your neck pain?

No pain Worst pain possible

1 2 3 4 5 6 7 8 9 10

2. Over the past week, how much has your neck pain interfered with your daily activities (housework, washing, dressing, lifting, reading and driving)?

No interference Unable to carry out activity

1 2 3 4 5 6 7 8 9 10

3. Over the past week, how much has your neck pain interfered with your ability to take part in recreational, social, and family activities?

No interference Unable to carry out

1 2 3 4 5 6 7 8 9 10

4 . Over the past week, how anxious (tense uptight, irritable, difficulty in concentrating/relaxing) have you been feeling?

Not at all anxious extremely anxious

1 2 3 4 5 6 7 8 9 10

5 . Over the past week, how depressed (down –in-the dumps and ,in low spirits, pessimistic, unhappy) have you been feeling?

Not at all depressed extremely depressed

1 2 3 4 5 6 7 8 9 10

6. Over the past week, how have you felt your work (both inside and outside the home) has affected (or would affect) your neck pain?

Have made it no worse Have made it much worse

1 2 3 4 5 6 7 8 9 10

7. Over the past week, how much have you been able to control (reduce/help) your neck pain on your own?

Completely control it No control whatsoever

1 2 3 4 5 6 7 8 9 10

0= Much better

5= no change

10=much worse

APPENDIX IV

MOIST HEAT PACKS

Moist heat packs is also applied in both groups for relieving pain. Gel packs is applied by wrapping in towel and placed over the affected upper trapezius muscle.

Position of the patient

Prone lying and the head turn around the unaffected side. Hands relaxed by the side.

Duration

10-15 minutes

POSITIONAL RELEASING TECHNIQUE

Positional release therapy is a very specialized technique focusing on treating protective muscle spasm in the body. This technique involves finding a tender point in the patient's body(muscle, ligaments, tendons and joints) and then moving the patient's body or body part away from the restricted motion barrier and towards the position of greatest comfort.

Once in this position of comfort, the point should no longer be tender. This precise position is held for a minimum of 90 seconds but can be held for several minutes. During this time period, the patient can feel heat, vibration, pulsation, and can even reproduce their symptoms. Once the release is complete, the heat, vibration, pulsation and pain will diminish and there will be a sense of lengthening and relaxation in the tissue. Once the release is felt, the patient is slowly taken out of the position of comfort and the tissue should be relaxed. The tender point should either be completely gone or 70% better.

After a successful treatment, the patient will experience decreased pain, muscle spasm, fascial tension, joint stiffness and swelling. There will be improved postural alignment, mobility, flexibility and range of motion. Even though the patient may feel they are experiencing less of their initial pain and are moving better after a treatment, they may still feel aches in their body for several days afterwards as their body adjusts to the changes. This reaction quickly goes with subsequent treatments and does not occur with every patient.

Mechanism of positional release technique

Positional release technique act on the muscle spindle mechanism and its associated reflex mechanism(which control spasm) to promote a more normal firing of the spindle and a more normal level of tension in the muscle which result in more normal relationship within the various soft tissue surrounding the area. These techniques work to reduce the hyperactivity of myotatic reflex arc and to reduce the over whelming afferent nerve impulses within the arc that may lead to an overflow of neurotransmitters into the associated dermatome, resulting in referred pain (facilitated segment). The mechanism behind this technique is that the shortening of the muscle sends a signal to the brain causing the muscle contraction to be reduced. This technique is used for relief of somatic dysfunctions that are too acute or too delicate to treat with other procedures.

Procedure

- ✓ Position of the patient: patient is in sitting position
- ✓ Position of the therapist: near to affected side of patient
- ✓ Technique: The therapist localizes the tender points along the trapezius. Pressure is applied by pinching the muscle between the thumb and fingers. The subjects head is laterally flexed toward the side of tender point (opposite side rotation) then therapist grasp the subjects forearm and abduct shoulder to approximately 90 degree and add slight flexion and extension to fine tune. The ideal position of comfort achieved was held for a period of 90 seconds and followed by a passive return of the body part to an anatomically neutral position continued for 5 minutes.

ISCHEMIC COMPRESSION TECHNIQUE

Position of patient: Patient was placed supine on the couch with his head fully on the surface of the couch, to reduce tension in the upper trapezius muscle. Arm was positioned in slight abduction with the elbow bent and their hands resting on their stomach.

Position of the therapist: To perform this IC to the upper trapezius, therapist stands at the head of the couch.

Technique:

- At first, the therapist uses a pincher grasp moved throughout the fibers of the upper trapezius and made note of the any active trigger points.
- To locate a trigger point, palpate the muscle to feel for a taut band (or) a twitch response in the muscle belly. The common location of upper trapezius trigger points is in the middle of the muscle belly, approximately 1 to 2 inches medial to the acromion process of the scapula.
- Once the trigger point is located, apply an IC by gradually applying pressure to the trigger point with your thumb.
- While applying pressure, the patient will likely feel referred pain in a question mark pattern(along the back of the neck, around the side of the head, and then focused pain right behind the eye).
- Keep in communication with patient, to check whether the patient is staying within the limits of his pain tolerance.
- Hold this technique for approximately 20 seconds to 1 minute, patient tells you that pain has diminished, or until feels the muscle fiber begin to relax under your pressure. once feel this release, gradually release pressure.
- All identified trigger points was treated. Then apply a few effleurage strokes to flush out the area and follow up with a passive stretch to the muscle.

- This was repeated for three to five times for three sessions per week for 14 days.

APPENDIX V

HOME EXERCISE PROGRAM

- Chin tucking exercise
- Active neck flexion and extension
- Lateral flexion
- Side to side rotation
- Shoulder shrugs
- Shoulder protraction and retraction
- Isometric exercise for neck

An ergonomic advice also conducted for each group and given home advice. The ergonomics advice given depends upon patient work place and job.

❖ **Active Exercises**

Chin tucking exercises:

Sit in a chair with your back firmly supported by a wall or the back of the chair. Make sure the back of your head, shoulders and upper back are against the wall, you are looking straight ahead and the underside of your chin is level with the floor. Slowly move your chin back and slightly down so your ears are in line with your shoulders and you feel a stretch in the back of your neck. Hold for 10 seconds and release. Do a couple of sets of 10 repetitions every day, if you can. You can also perform this exercise while lying flat out on thefloor.

Active neck flexion and extension:

Cervical Flexion (bringing your chin to your chest) and Cervical Extension (looking up to the ceiling). You want to start by tucking your chin in and gently bringing your head forward and attempting to touch the chin to the chest. Next, gently bend the head backwards as far as it will go and come to neutral position and bend the head forward. Repeat this exercise 5 times. Forward head flexion is great for those patients who suffer from hypertonic cervical paraspinals- which is essentially pain in the back of the neck.

Lateral flexion exercise:

Bring your right ear to your right shoulder as far as you are able to. Do not rotate or turn your head when you are doing this neck stretch. Come to neutral position and then bring your left ear to the left shoulder. Repeat this for 5 times.

Side to side rotations:

In this exercise you want to turn your head to the right as far as you possibly can, trying to bring your chin over your shoulders. When you are doing this neck exercise, do not bring up your shoulders. Hold this position for 3 to 5 seconds. Next do this on the left side of the neck and repeat for 5 times.

- **Shoulder shrugs:**

Stand up straight in good posture. Keep your arms straight, shrug your shoulders straight up toward your ears as high as you can. Hold this uppermost position for one to two seconds. Do not roll your shoulders backward and lower your shoulders back down but do not fully relax. Perform six to 10 repetitions.

- **Shoulder protraction and retraction:**

Stand up straight in good posture. Keep your arms straight, move your shoulder forwards and hold this uppermost position for one to two seconds. Then come to neutral position. Then move your shoulder backward followed by neutral position. Perform 5 to 10 repetitions.

❖ **Isometric exercise for neck**

- **Neck Flexing:**

Bend your neck slightly forward and put your hand on your forehead. Try to bend your head forward while pushing back with your hand. Hold for 5-8 seconds.

- **Neck Extension:**

Keep your up and your neck straight and place your hands at the back of your head. Try to push your head backwards while pushing forward with your hands. Hold for a count of 5-8 seconds.

Side Bending:

Keep your head straight and your chin level. Put your right hand on the right side of your head. Try to bring your head down to your right shoulder while pushing up with your right hand. Hold for 5-8 seconds. Repeat the Side Bending, but to the left side with your left hand.

- **Rotation:**

Put your left hand at chin level and turn your head slightly to the right. Put your right hand on the right side of your face. Turn your head to the right while pushing it back with your right hand. Hold for a count of 5-8 seconds.

❖ **Self stretch**

Positioning: You can do this sitting or standing. Always have your hand on the shoulder you want to stretch to prevent it from moving up. The other hand should be on top of your head with your fingers pointing towards the back. Your neck should always remain in line with your back and the only body part that is moving is your head.

- **Forward stretch:** Gently pull your head forward with your chin toward your neck as if you were nodding. Hold this position for 10 to 15 seconds.

- **Side stretch:** Gently pull your head to the side so your ear approaches the opposite shoulder. Switch sides. Hold this position for 10 to 15 seconds.

- **Diagonal stretch:** Gently pull your head diagonally forward so your chin approaches the opposite shoulder. Hold this position for 10 to 15 seconds.

Repeat these stretches for the other side. Start with the forward stretch, but this time, your hand should be on the opposite shoulder. Go through these stretches 2 to 3 times in one sitting and repeat throughout the day.

ERGONOMICS MODIFICATIONS AND HOME EXERCISES

ERGONOMICS MODIFICATIONS

Ergonomics is the process of designing or arranging work places, products and systems so that they fit the people who use them. Ergonomics aims to improve workspaces and environments to minimize risk of injury or harm. It is often important to look at the work place ergonomics as part of treatment and prevention of neck pain. Perhaps the placement of the desk, computer workstation and/or placement of the computer monitor and keyboard can be improved to encourage improved neck posture. The goal of an ergonomics program in industry is to adapt the workplace to a specific worker, dependent on the job description, required tasks, and physical make up of the employee performing those tasks.

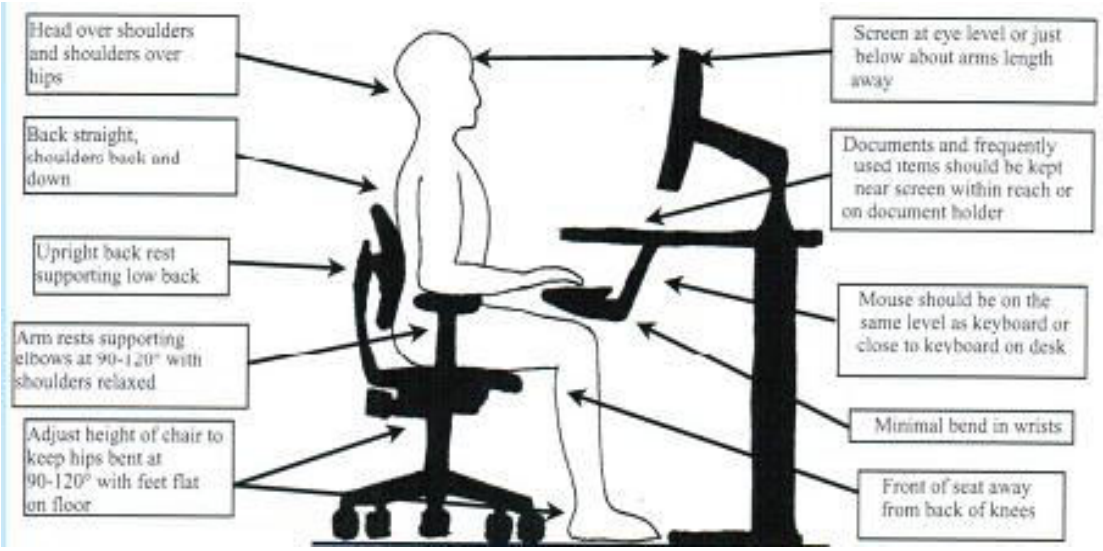
❖ **General Ergonomics modifications**:

- Avoid same posture for long time
- Use correct pillow position and height
- Avoid excessive load on head and shoulder
- Avoid holding phone in between neck and shoulder
- Take a break in between works.
- Maintain good posture during work
- Adjust and modify work places up to the level that you can work with little effort and stress.

❖ **Ergonomics modification for computer workers:**

- Place the keyboard in a position that allows the forearms to be close to the horizontal and the wrists to be straight.
- Adjust the seat tilt so that you are comfortable when you are working on the keyboard.
- Avoid cradling the phone between your head and shoulder when answering calls.

- Set the eye-to-screen distance at the distance that permits you to most easily focus on the screen.
- Place the document holder close to the monitor screen in the position.
- Adjust the height of the work surface that allows your elbows to be bent at 90°, forearm parallel, shoulder and wrist relaxed.
- Place the monitor to the side of the light source/s, not directly underneath.
- A well-designed mouse should not cause undue pressure on the wrist and forearm muscles.
- Maintain good posture.



❖ **Ergonomics modification for driving area:**

1. Adjustable seat back incline (100 degrees from horizontal is optimal)
2. Changeable seat bottom depth (from seat back to front edge)
3. Adjustable seat height
4. Adjustable seat bottom incline

5. Seat bottom cushion with firm (dense) foam
6. Adjustable lumbar support (horizontally and vertically adjustable)
7. Depth pulsating lumbar support to reduce static load
8. Adjustable bilateral arm rests
9. Adjustable seat back incline (100-degrees from horizontal is optimal
10. Adjustable head restraint with lordosis pad
11. Linear front-back seat travel to allow differently sized drivers to reach the pedals
12. Seat back damped to reduce rebounding of the torso in rear-end impacts

DO'S AND DON'TS FOR MECHANICAL NECK PAIN:

❖ **DO'S**

✓ Do turn to one side while getting up from supine position.
✓ Use hot pack for your neck.
✓ Use towel roll under the neck during supine lying.
✓ Use pillow of normal thickness in side lying position
✓ Do isometrics for neck
✓ Arms should be supported in one of the three positions:
- Hands in pocket
- Hands on thighs /or on table.
- Hand behind back with elbow straight.

✓ In order to avoid holding the head in the same position for long periods, take break while driving, watching TV or working on a computer. Use a seat belt when in a car.
✓ Use cervical collar in case of giddiness.
✓ Retraction of shoulders every hour: move shoulders backward

❖ **DONTS' :**

✓ Don't sleep straight for long time
✓ Don't bend your neck.
✓ Avoid hanging of arms.
✓ Avoid sitting for prolonged period of time in stressful postures.

- ✓ Do not lift heavy weights on head or back.
- ✓ Do not drive for long hours; take breaks.
- ✓ Avoid habit of holding the telephone on one shoulder and leaning at it for longtime
- ✓ Do not take many pillows below the neck and shoulder while sleeping.
- ✓ In order to turn around, do not twist your neck or the body; instead turn around by moving your feet first.

APPENDIX VI

INFORMED CONSENT FORM

I_____ agree to take part in the project study titled **"Effectiveness of Positional release technique versus Ischemic compression on sedentary way of life with upper trapezius muscle trigger points"** conducted by_____ post graduate student (MPT), Sri Ramakrishna Institute of paramedical Sciences, college of physiotherapy, Dr. MGR Medical University.

I acknowledge that the research study has been explained to me and I understand that agreeing to participate in the research means that I am willing to,

- Provide information about my health status to the researcher.
- Allow the researcher to have access to my medical records, pertaining to the purpose of the study.
- Participate in the analysis program.
- Make myself available for further analysis if required.

I have been informed about the purpose, procedures and measurements involved in the research and my queries towards the research have been clarified.

I understand that my participation is voluntary and can withdraw at any stage of the research.

Signature of the patients/care giver:

Contact Address:

Signature of investigator: Date: